D. DoD Manufacturing Technology Program

DoD's Manufacturing Technology (ManTech) Program develops new and improved manufacturing processes to facilitate more affordable production of DoD weapon systems and components. The Program addresses process technology issues the systems development phase through transition to production and into sustainment. ManTech investments target defense-essential needs that industry would not otherwise pursue, alone, in timely manner. ManTech improvements generally translate into cost avoidance or cycle time reductions. However, investments also focus on developing "new" capabilities that actually may result in a more expensive component, but will provide dividends in system performance or life cycle cost that far outweigh the initial cost. The Program is structured around three major thrust areas:

- *Processing and Fabrication* activities develop affordable processes for metals, composites, electronics, and energetics/muntions by improving factory floor and repair and maintenance facility (depots, logistics centers, and shipyards) processes.
- *Advanced Manufacturing Enterprise* activities accelerate implementation of world-class industrial practices, advanced design, and information systems that support weapon system development, production and sustainment.
- *Sustainment* projects coordinate common DoD opportunities to increase the reliability and reduce the cost of repair processes for aging systems.

In response to the requirements of 10 U.S.C. section 2525(e), the Department issues an annual Five-year Plan for the ManTech Program in March of each fiscal year. The Plan, available on the Internet at http://mantech.iitri.org/pubs/pubs.shtml:

- Describes the ManTech Program's goals, priorities, investment strategy, management and planning processes.
- Presents Military Department and Defense Logistics Agency funding for fiscal year 2001, and planned funding for fiscal years 2002 through 2006.
- Includes a description of all projects completed in FY 1999 and FY 2000, and the status of implementation.
- Assesses the extent of cost sharing with commercial enterprises, defense program offices, other federal agencies, institutions of higher learning, and other sources.
- Summarizes program measures of effectiveness and the results of internal and independent reviews.
- Provides examples of success stories and achievements.

Technology Transfer & Dual Use

The ManTech program is driven by defense needs for technologies and systems that provide a superiority edge to the warfighters. In today's environment, DoD is involving the commercial industrial base as soon as possible, by either adopting its best practices or transferring results of military processes to the commercial arena. For example:

- The Navy's Best Manufacturing Practices (BMP), managed by ONR and funded by the Navy's Manufacturing Technology (ManTech) program, received the Hammer Award. The Navy's BMP program is based on companies' voluntary sharing of information and is executed through its unique on-site survey process. Teams of impartial experts from government, industry, and academia document best practices worthy of sharing. To date, 120 surveys have been conducted, 5,000 practices documented, how-to guidelines published, an Internet site established making BMP's resources easily accessible, and a partnership has been set up with the Department of Commerce and the University of Maryland at College Park to create the BMP Center of Excellence (BMPCOE). The BMPCOE and ten satellite centers around the country serve the Navy, the DoD, and U.S. industry. The BMP has changed the cultural bias of the U.S. industrial base toward technology transfer from a close-hold, company-proprietary mentality to a more open, willingness-to-share attitude.

- Two programs received this year's annual Defense Manufacturing Technology Achievement Award, which recognizes Defense and private sector individuals responsible for developing innovative manufacturing processes that improve the affordability, cycle time, or readiness of Defense weapon systems or components. The programs included:

  - The Army's Advanced Optics Manufacturing program developed a multi-axis, computer-controlled optical finishing technology, known as Magnetorheological Finishing (MRF), that provides significant cost savings in the manufacture of precision optical surfaces. Compared to conventional, labor-intensive processing methods, MRF reduces the typical cost of spherical optics from $100 to $60, and reduces system weight up to 30 percent. The MRF finishing machine is commercially available, and has received industry-wide acclaim, winning two of the optical industry's most prestigious awards for technology innovation and achievement: the Photonics Circle Excellence Award and the Laser Focus World (LFW) Commercial Technology Achievement Award. Manufacturers of photolithographic optics and several major optics shops in the United States have already installed multiple MRF machines to produce ultra-high precision optics.

- The Flexible Manufacture of Microwave Vacuum Devices program has resulted in significant cost reductions and increased yield in traveling wave tube devices for critical military applications, and improvement of on-shore domestic sources for devices previously imported from Europe. Microwave devices are used in over half of the current Defense weapon systems. With less than 20 percent overlap between the Defense and commercial markets, there is little opportunity for the Department of Defense to leverage means for commercial-off-the-shelf suppliers to provide cost effective, state-of-the-art devices. A government/industry team consisting of representatives from the Army, Navy, Air Force, the American Competitiveness Institute, Communications and Power industries, Northrop Grumman, and Teledyne Electronic Technologies led the initiative. The team worked on manufacturing improvements for devices in critical segments of the power/frequency spectrum.

Recent Management Initiatives & Accomplishments

The Science & Technology (S&T) Affordability Task Force continues to establish processes to strengthen the affordability content of the DoD's S&T programs. The objective is to identify mechanisms that focus DoD's technology programs on implementing Integrated Product and Process Development (IPPD), and facilitate use of Integrated Product Teams. In 2000, the Task Force:

- Reviewed and evaluated 20 S&T programs for attention to affordability.
- Continued development of training initiatives with each of the Military Services, including a prototype "Technology Insertion" course now being prototyped at the Defense Systems Management College.
- Hosted a session with acquisition program managers to identify barriers to transition.
- Published a handbook for S&T managers for use during formulation of affordability programs.

The annual Defense Manufacturing Conference continues to be a premier activity for networking and sharing the results of ongoing and completed manufacturing programs across the DoD, industry, and other government agencies. The 2000 conference was held in Tampa, FL. Over 700 leaders from government, industry, and academia attended. The conference featured panel sessions providing customer viewpoints from both the weapon systems and logistics community. Exchange of technical information was promoted by use of concurrent briefings spanning over 100 technical projects, and via evening receptions held with over 70 exhibitors from DoD, industry, and academia.

To improve ownership for the ManTech program, the Joint Defense Manufacturing Technology Panel (JDMTP) updated the "Overarching Strategy"

brochure. This document is being used to facilitate communication of ManTech's purpose, vision, role of the JDMTP, and success stories to improve program advocacy with the internal and external program customers across the DoD, with Congress, industry, and academia.